Transport Canada
Air

Transports Canada
Air

TP506

study questions for private pilots

second edition 1977

FOREWORD

These study questions have been prepared by the Training and Examination Section of the Civil Aeronautics Branch of Transport Canada, to assist applicants preparing for their Private Pilot Licence written examination.

The questions contained in this publication are typical of those which a candidate may expect in the examination.

The written examination for a Private Pilot Licence will comprise 100 questions with multiple choice answers, including pilot navigation problems associated with a typical cross country flight.

Available by mail from

Printing and Publishing
Supply and Services Canada
Ottawa, Canada K1A 0S9

or through your bookseller.

Catalogue No. T52-44/1977 Canada: $3.00
ISBN 0-660-00969-2 Other countries: $3.60

Price subject to change without notice.

INDEX

PART/CHAPTER PAGE

CONTENTS

PART I

Chapter 1	Air Regulations	1
Chapter 2	Air Navigation Orders	7
Chapter 3	Notices to Airmen (NOTAM)	11

PART II

Chapter 1	Airmanship (Aircraft Operations)	13
Chapter 2	Engines/Propellers Maintenance	23
Chapter 3	Instruments	27
Chapter 4	Theory of Flight	31

PART III

Chapter 1	Meteorology (General)	35
Chapter 2	Meteorology (Weather Maps)	41

PART IV

Chapter 1	Navigation (Cross country flight)	47
Chapter 2	Navigation (General)	55

The Toronto - Ottawa Aeronautical Chart N.T.S. No. 31 SW, and labelled "FOR EXAMINATION PURPOSES ONLY SERIES 4" is supplied for use with the navigation study questions.

ABBREVIATIONS

AME	Aircraft Maintenance Engineer
ATC	Air Traffic Control
AGL	Above ground level
ASL	Above sea level
C	Celsius (Centigrade)
CAS	Calibrated Airspeed
C of A	Certificate of Airworthiness
ELT	Emergency Locator Transmitter
ETA	Estimated time of arrival
F	Fahrenheit
IAS	Indicated airspeed
kHz	Kilohertz
KT	Nautical miles per hour
LB	Pound(s)
MHz	Megahertz
MPH	Miles per hour
NM	Nautical Miles
NOTAM	Notices to Airmen
RPM	Revolutions per minute
TAS	True airspeed
VFR	Visual flight rules
VHF	Very high frequency
VOR	VHF omni-directional range
VORTAC	Omni-directional range and tactical air navigation system at one site
W/V	Wind velocity (speed and direction)

PRIVATE PILOT STUDY QUESTIONS

AIR REGULATIONS

1. What single term in the Air Regulations includes aeroplanes, balloons and all other machines capable of deriving support in the atmosphere from the reaction of the air?

2. What does "controlled airspace" mean?

3. What is a "control area"?

4. What is the height of the lower limit of controlled airspace in a control area?

5. According to the Air Regulations, what is the definition of a control zone?

6. An aircraft is over Carp Airport ($45^{\circ}20'N-76^{\circ}02'W$), at 500 feet AGL. Is the aircraft within controlled airspace?

7. Is an aircraft within controlled airspace when at an altitude of 1382 feet in the circuit at Carp Airport?

8. What action must be taken by the owner of a Canadian aircraft when it is permanently withdrawn from use?

9. What is the period of time that a certificate of registration remains valid, after a Canadian aircraft has changed ownership?

10. What action must be taken by the "previous owner" of a Canadian aircraft when ownership is transferred?

11. How soon after acquiring ownership of an aircraft shall the new owner apply to have the aircraft registered in his name?

12. What period of time is allowed for a new owner of a Canadian registered aircraft to apply to have it registered in his name, before the registration shall be deemed to have been cancelled?

13. Within what period of time must the owner of a Canadian aircraft notify the Director General, Civil Aeronautics, of any change in his permanent address?

14. May an aircraft be flown in Canada without a valid C of A or flight permit?

15. What information shall be inscribed on the fireproof identification plate required in every aircraft?

16. Under what circumstances is it required that a pilot report landing at an airport to the operator of that airport or his accredited represent-ative?

17. From whom may permission be obtained to walk, drive or park a vehicle on any part of an airport used for the movement of aircraft?

18. What restriction is imposed upon a flight crew member, with respect to resuming flight crew duties following the use of alcohol or drugs?

19. What restriction is imposed upon a flight crew member when aware of a disability which might render him unable to meet the physical requirements for his licence?

20. What is the principal difference between an ATC "clearance" and an ATC "instruction"?

21. What restriction applies with respect to dropping anything from an aircraft in flight?

22. May acrobatic flight be conducted over any urban or other populous areas?

23. How many persons may occupy an aircraft during acrobatic flight when a flight instructor is not on board?

24. What is the minimum height that an aircraft shall be flown over an aerodrome except for the purpose of taking off or landing?

25. What pre-arrangement is necessary before formation flying may be conducted outside a control zone?

26. What pre-arrangement is necessary before formation flying may be conducted within a control zone?

27. Which aircraft shall give way when two aircraft are converging at approximately the same altitude?

28. Which aircraft shall give way when an aeroplane and a glider are converging at approximately the same altitude?

29. When is a pilot-in-command responsible for taking action to avoid a collision?

30. Which way shall each aircraft turn when two aircraft are approaching head-on and there is danger of collision?

31. Which direction shall an overtaking aircraft turn to keep out of the way of the aircraft being overtaken?

32. What is the regulation concerning giving way to aircraft landing or about to land?

33. What precaution shall be taken, with regard to collision, before a take-off is commenced?

34. How soon after being requested to do so, must the pilot-in-command submit a full written report to ATC, with respect to an emergency declared which required an ATC priority?

35. In accordance with the Air Regulations, which officers are authorized to demand that a licence, permit or certificate issued under the Air Regulations be produced for inspection?

36. What are the regulations with respect to the altitude at which an aircraft shall be flown over built up areas of a city, town or settlement?

37. How soon shall a pilot-in-command notify the appropriate agency of a deviation from a VFR flight plan or flight notification?

38. How soon after landing shall the pilot-in-command of an aircraft report his arrival to ATC, when a VFR flight plan has been filed?

39. How soon after landing shall the pilot-in-command of an aircraft report his arrival to ATC, when a flight notification had been filed with an air traffic control unit?

40. What procedure should a pilot use to close a flight plan?

41. Are VFR flights always required to operate with visual reference to the ground or water?

42. What is the amount of fuel and oil that must be carried on board any aeroplane at the commencement of any VFR flight?

43. What licence endorsement is required by the holder of a private pilot licence to operate a flight without visual reference to the ground or water?

44. What lights shall be displayed at night by aeroplanes in flight or manoeuvring on the ground?

45. What is the directional light signal to an aircraft in flight which means "cleared to land"?

46. What is the directional light signal to an aircraft in flight which means "give way to other aircraft and continue circling"?

47. What is the directional light signal to an aircraft in flight which means "return for landing"?

48. What is the directional light signal to an aircraft in flight which means "airport unsafe; do not land"?

49. What is the directional light signal to an aircraft on the manoeuvring area of an aerodrome which means "cleared to taxi"?

50. What is the directional light signal to an aircraft on the manoeuvring area of an aerodrome which means "stop"?

51. What is the directional light signal to an aircraft on the manoeuvring area of an aerodrome which means "cleared for take-off"?

52. What is the directional light signal to an aircraft on the manoeuvring area of an aerodrome which means "taxi clear of landing area in use"?

53. What is the directional light signal to an aircraft on the manoeuvring area of an aerodrome which means "return to starting point on airport"?

54. What instruction is given by the firing of a red pyrotechnical light?

55. What pyrotechnical signal would indicate an aircraft is flying in the vicinity of a Prohibited, Danger or Restricted area?

56. Describe "night" as defined in the Air Regulations?

57. May explosives or other dangerous articles be carried on board any aircraft?

58. What safety precautions are required while the engine or engines of any aircraft are left running?

59. May an aircraft take off or land by night at an unlighted aerodrome?

60. How shall the holder dispose of a cancelled or suspended licence or certificate issued under the Air Regulations?

61. Unless otherwise authorized by the Minister, what certificates, licences and/or permits shall be carried on board an aircraft in flight?

62. May an aircraft be flown without the aircraft technical log book on board?

63. How long after the date of the last entry shall the owner of an aircraft preserve the aircraft journey log book?

64. What entries from a previous aircraft log book are required to be entered in a new log book?

65. May an aircraft be flown in acrobatic flight over an assembly of persons?

66. Define an airport.

INTENTIONALLY LEFT BLANK

AIR NAVIGATION ORDERS

67. What are the requirements concerning the provision of safety belts or safety harnesses in aircraft?

68. State the manner in which infants are to be secured with respect to the use of safety belts or harnesses during take off and landing.

69. How often must a privately registered aircraft of 12,500 pounds gross weight, or less, be certified as airworthy by an AME or other qualified person, to maintain the validity of the C of A?

70. Which Department of Transport Publication specify the instrument equipment required to operate an aircraft on a night VFR flight?

71. What radio equipment is required when operating an aircraft VFR at night within controlled airspace out of sight of the aerodrome of departure?

72. What is the maximum time an unpressurized aircraft may be operated between 10,000 feet ASL and 13,000 feet ASL without a readily available supply of oxygen?

73. What is the altitude above which unpressurized aircraft may not be flown unless specified oxygen supply and breathing apparatus is available?

74. What colours are specified for the wind cone and boundary markers at unlicensed aerodromes?

75. Which of the Department of Transport Publications specify the privileges attached to a Private Pilot Licence?

76. What endorsement is required before the holder of a valid Private Pilot Licence may carry passengers in an aircraft over 4,000 pounds gross weight?

77. What are the recent experience requirements regarding take-offs and landings, that the holder of a Private Pilot Licence must fulfill before acting as pilot-in-command at night carrying passengers?

78. Within what designated airspace must an aircraft be flying when operating in accordance with a Special VFR clearnace?

79. What are the minimum weather conditions under which an aeroplane may be given a Special VFR clearance?

80. When an aircraft is cleared for Special VFR flight, who is responsible for avoiding weather conditions beyond the capability of the pilot?

81. What is the specific height AGL, above which an aircraft shall comply with the Cruising Altitude Order?

82. Is 6000 feet an appropriate cruising altitude in accordance with the Cruising Altitude Order, when flying VFR on a magnetic track of 315^{o} within controlled airspace?

83. What is the minimum ground visibility for VFR flight within a control zone?

84. What is the minimum flight visibility for VFR flight within control areas?

85. What is the minimum flight visibility for VFR flight within a low altitude airway?

86. What distance from cloud must be maintained, for VFR flight within controlled airspace?

87. How do the VFR weather minima within aerodrome traffic zones compare with the minima within control zones?

88. What are the VFR weather minima for flight conducted in uncontrolled airspace?

89. Is a flight plan or flight notification required for VFR flight at night?

90. What is the flight plan or flight notification requirement for VFR flight conducted wholly or partially within sparsely settled areas?

91. Under what circumstances is it necessary to complete the "Flight Altitude" block when submitting a VFR flight plan?

92. What is the signal in radiotelephony which means that grave and imminent danger threatens and immediate assistance is required?

93. What is the signal in radiotelephony which means that an aircraft has a very urgent message to transmit concerning the safety of another aircraft?

94. With respect to the use of visual ground signals, what marking may be displayed by day to indicate unserviceability of any portion of the manoeuvring area?

95. Is there a requirement for single-engined aircraft to carry special equipment and supplies when flying into a sparsely settled area?

96. Do the CADIZ and DEWIZ rules apply to all aircraft regardless of TAS?

97. Is an Air Traffic Control clearance required for VFR flight within the Block Airspace?

98. What barometric pressure shall be set on the altimeter when flying in the Altimeter Setting Region?

99. What is the altitude within controlled airspace that an altimeter shall be changed from the current altimeter setting to standard pressure?

100. What is the correct altimeter setting for flight within the standard pressure region?

101. May an aeroplane without a functioning two-way radio be authorized to operate within a positive control zone?

102. Who is responsible for ensuring that aircraft maintain adequate clearance from obstructions when operated in accordance with a Special VFR flight clearance?

103. In radiotelephony, what spoken word means that an aircraft has difficulties that compel it to land, but immediate assistance is not required?

104. What do the words "RONLY" and "NORDO" mean when used in radiotelephony?

105. Define Flight Itinerary?

106. When is a valid licence required?

INTENTIONALLY LEFT BLANK

NOTAM

107. What radio frequency should be used at a controlled airport when requesting a radio check and taxi clearance?

108. What light signal must a NORDO aircraft receive from the control tower before taxiing across the runway in use?

109. Which frequency should be used on all aircraft to monitor and broadcast intentions while manoeuvring near uncontrolled airports or when cruising in uncontrolled airspace?

110. What does it indicate when a pilot is advised on the downwind leg of the circuit, that he is "number one"?

111. What is the VHF emergency frequency?

112. What is the system used to determine the numbering of runways on airports or aerodromes throughout Canada?

113. What number would be assigned to the east end of a runway with an east/west orientation?

114 What is indicated when the rotating beacon of an aerodrome or airport is lighted by day?

115. What does the meteorological term CAVOK (KAV-OH-KAY) mean?

INTENTIONALLY LEFT BLANK

AIRMANSHIP

AIRCRAFT OPERATIONS

151. Why is it important to ensure that the centre of gravity of an aircraft is kept within specified limits?

152. What is the reason a maximum weight is usually specified for the baggage compartments of smaller aeroplanes?

153. What would be the effect on the indicated stalling speed of an aircraft, if the weight of the aircraft was increased?

154. What effect would the accumulation of ice on an aerofoil in flight have upon the stalling speed of an aeroplane?

155. What activates stall warning devices on light aeroplanes in flight?

156. What action should be taken when an aircraft engine overheats while taxiing?

157. Unless otherwise directed, where on an airport, should the engine run-up normally be performed before take-off?

158. What is meant when a ground attendant signals to the pilot of an aircraft by moving his hand across his throat in a slicing motion?

159. Where should the elevators be positioned when taxiing a tail wheel equipped aeroplane in a strong wind blowing from behind?

160. When taxiing a nose wheel equipped aeroplane in a strong wind, which combination of turning and wind direction would contribute most to possible upset?

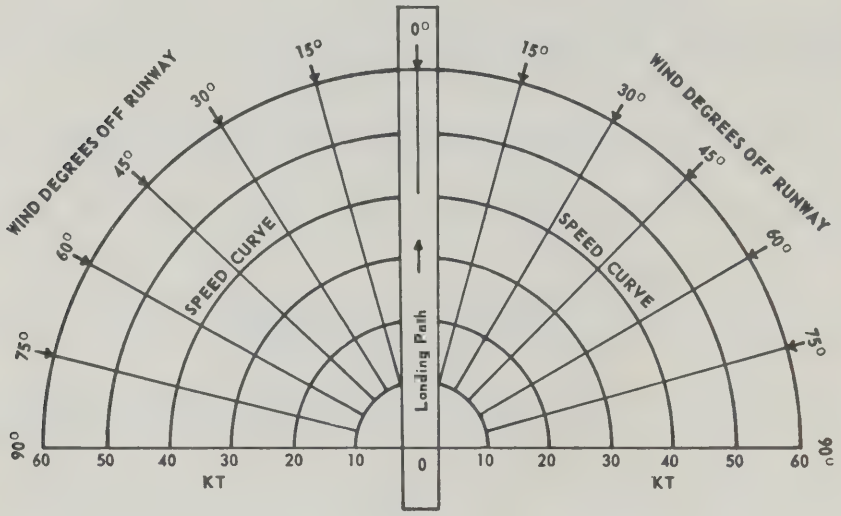
161. What precaution should be taken to prevent damage to overheated brakes when parking an aircraft?

162. Why is it considered bad practice, in the case of an aircraft equipped with disc brakes, to leave the parking brake "on" when the brakes are hot?

Most aeroplanes are designed to withstand ground looping tendencies when landing in 90° cross winds up to a velocity of 20% of the stalling speed.

163A What is the maximum angle a 36 KT wind may be "off" the runway for a landing to be made within these limitations, if the stalling speed is 60 KT? (Use the wind side of the computer for calculating the cross wind component)

163B What is the maximum angle a 40 KT wind may be "off" the runway for a landing to be made within these limitations, if the stalling speed is 55 KT? Use the chart below.



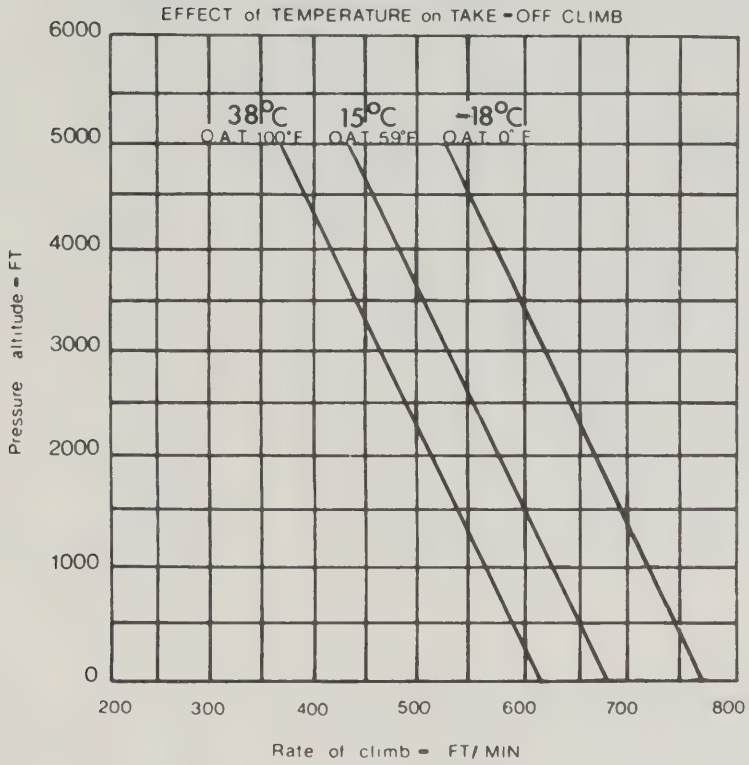
164. An aircraft is on final approach for landing in a gusty cross wind. What will be the effect of an increase in wind speed on ground speed and drift?

165. Why are light aeroplanes equipped with flaps?

166. Given

Pressure Altitude	1500 Feet
Outside Air Temperature	59^{o} (F) (15^{o}C)

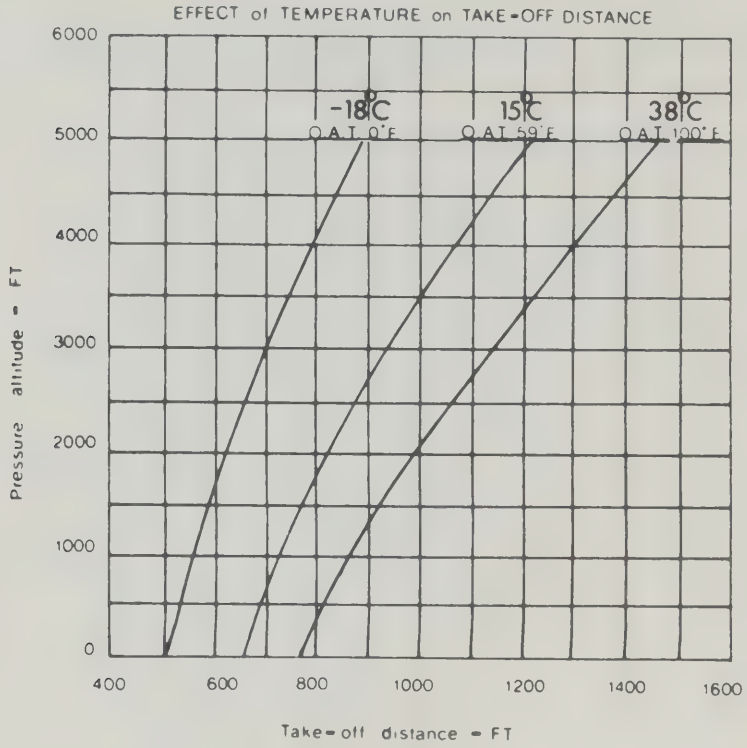
From the graph below, determine the rate of climb.



167. Given

Pressure Altitude	4000 Feet
Outside Air Temperature	100° (F)

From the graph below, determine the take-off distance required.

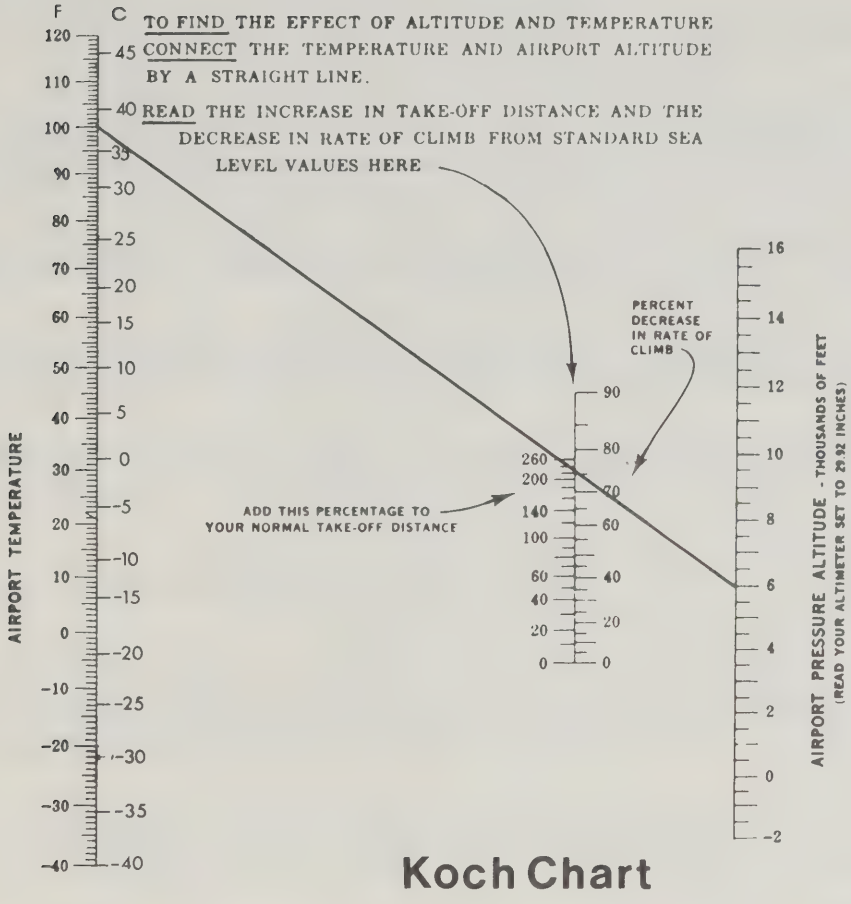


168. An aeroplane required 800 feet take-off distance and has a rate of climb of 600 feet per minute at sea level in a standard atmosphere. What would be the take-off distance and rate of climb for the same aeroplane using the Koch chart on the following page given the following conditions?

Barometric Pressure	29.92
Temperature	60° (F)
Aerodrome Pressure Altitude	4,000 feet.

THE KOCH CHART FOR

ALTITUDE AND TEMPERATURE EFFECTS



169. What may cause "wheelbarrowing" during landing?

170. How may the possibility of "wheelbarrowing" be minimized on take-off or landing?

171. Define "Maximum Endurance Speed".

172. When would a pilot use the "best rate of climb speed"?

173. When would a pilot use the "best angle of climb speed"?

174. What should be done if cylinder head temperatures have dropped below recommended limits while in a prolonged glide?

175. What precaution should be taken before landing a wheel equipped aeroplane on a snow covered surface?

176. What is of special concern to VFR pilots when flying in snow, over a snow covered surface, and the natural horizon is obscured?

177. What would be the primary reason for deterioration of performance if there was an accumulation of snow, ice or hoar frost on the wings and control surfaces of an aeroplane?

178. Why is judging height difficult when approaching to land over glassy water or snow covered surfaces?

179. What is the recommended action if a light aircraft, on a VFR cross country flight at 2000 feet AGL below an overcast of stratus cloud, encountered a gradual lowering ceiling, intermittent drizzle and light icing?

180. What effect does rain on the windscreen of an aeroplane have on the appearance of objects such as the summits of hills, etc?

181. What effect would use of a windscreen rain repellant kit have on visibility during flight in rain?

182. Would an aircraft be above, below, or on the approach slope of a VASIS equipped runway if, on final approach, both the upwind and downwind bar lights are red?

183. What colour are the downwind and upwind wind bar lights respectively during a correct approach to a VASIS equipped runway?

184. What is the recommended procedure for recovering from a spin in a single-engined aeroplane?

185. What is the recommended procedure for recovering an aeroplane from a spiral?

186. Would aileron control feel sloppy or firm and would the indicated airspeed remain constant when in a spin?

187. Would aileron control feel sloppy or firm and would the indicated airspeed remain constant when in a spiral?

188. Can an aeroplane spin without first entering a stall?

189. What immediate action must be taken when a single-engined aeroplane experiences engine failure during a climb?

190. What action is of primary importance, following an engine failure during flight in a single-engined aircraft?

191. What approach and/or landing procedure should be followed to reduce risk of injury or damage, when an aircraft is committed to a forced landing in a field which is too short for complete deceleration?

192. Why is speed control so important when making a short field approach for landing over a high fence into a confined space?

193. How would a pilot ensure the landing surface is satisfactory before landing for the first time on an unlicenced field?

194. In which direction do aeroplane wing tip vortices rotate?

195. What is the approximate period of time wake turbulence may be encountered after passage of a large aircraft?

196. Is it possible for the downward currents which occur between wing tip vortices to be strong enough to exceed the climb capability of a light aircraft?

197. What causes the dangerous turbulence often found in the wake of a large heavy aeroplane?

198. What causes wing tip vortices?

199. Are wing tip vortices generated by an aeroplane in flight caused directly by "jet wash"?

200. What size of aeroplane and flight configuration generates the most hazardous wake turbulence?

201. What precautions should be taken by the pilot during approach and landing when following a large transport aircraft?

202. What precaution should be taken by operators of light aircraft when parking for engine "run up" behind large aircraft?

203. What colour is used to identify 100/130 aviation fuel?

204. What precaution should be taken when using residual fuel from drums i.e., (fuel below standpipe level) to refuel an aircraft?

205. What element besides sediment may cause a reduction of fuel flow through a chamois filter when refuelling an aircraft from a drum?

206. What would be the possible result of a loose fuel filler cap in flight on an aircraft equipped with wing tanks?

207. Why is it important that a sample of fuel, from fuel sumps and filters, be inspected before each flight?

208. What colour is used to identify 80/87 aviation fuel?

209. What precaution should be taken to reduce the risk of water contamination in the fuel tanks of an aeroplane when it is to be parked for several days?

210. Should the next higher or next lower octane fuel be used when the recommended fuel for a particular aircraft is not available?

211. Why is fuel of a high octane rating required in high compression engines?

212. What flight patterns shall be flown to alert Radar Assistance?

213. After intercepting a NORDO aircraft in distress, the rescue aeroplane rocks its wing from a position ahead, then starts a slow turn to the left or right. What should the distressed aircraft do?

214. What can be done to enhance a light aircraft's reflectivity on a radar screen?

215. Which publications other than the Canada Air Pilot lists the Ground-Air Emergency Code?

216. Where should an aircraft be flown in relation to canals, roads, railways, etc., when using these features as visual aids to navigation?

217. Does the VFR Chart Supplement provide the detailed information concerning direction and length of runways on airports in Canada?

218. How may the relative movement of other air traffic, when viewed through the windshield of an aircraft, be used to determine if each is on a collision course?

219. Are two aircraft on a collision course if the pilot of one aircraft, on a steady heading, observes another aircraft at the 2 o'clock position apparently not moving but increasing in size?

220. In which position should the elevators be secured on an aircraft, equipped with a tail wheel, which has been tied down with the tail into wind?

221. What precaution must be taken when using nylon rope to tie down an aeroplane?

222. What precaution must be taken when using manila rope to tie down an aeroplane?

223. What may cause Flicker Vertigo during the approach and landing of a single-engined aeroplane?

224. Is euphoria (a sense of well being) one of the symptoms of Flicker Vertigo?

225. How may the possibility of Flicker Vertigo be avoided or reduced during the approach and landing in a single-engined aeroplane?

226. Would one alcoholic beverage taken at 6000 feet have a greater or lesser effect than the same beverage taken at sea level?

227. What are the early symptoms a pilot would experience if he inhaled a concentration of carbon monoxide over a period of time?

228. What is a major early symptom of Hypoxia?

229. What period of time should elapse before a pilot resumes flight duties after receiving local or general dental or other anasthetics?

230. When is an aeroplane said to be in slow flight?

INTENTIONALLY LEFT BLANK

ENGINES PROPELLERS MAINTENANCE

231. Two light aeroplanes of the same type are equipped with fixed pitch propellers. The propeller on aeroplane "A" is of a relatively fine pitch (high R.P.M.), when compared to that fitted to aeroplane "B". Give the advantages and disadvantages of propellers "A" and "B" during take-off, climb and cruise?

232. How are engines cooled in most light aircraft?

233. When is fine pitch (high R.P.M.) used in the case of an aircraft equipped with a controllable pitch propeller?

234. What is the purpose of a tachometer in an aeroplane?

235. What action should be taken if, after starting an engine, oil pressure is not indicated?

236. What would most likely cause oil pressure to fluctuate from normal to zero in an aircraft engine?

237. What is an undesirable result from prolonged idling of a piston engine?

238. Why cannot a normally aspirated engine maintain rated horsepower at altitude?

239. What is the principal reason for supercharging aircraft engines?

240. May an unserviceable airspeed indicator in a privately registered aircraft be replaced by the owner if he does not hold a valid AME licence?

241. An aircraft owner who does not hold an AME licence, wishes to reinstall the wheels on his fixed gear aircraft. Must the work be completed by the holder of an AME licence?

242. A person not holding a valid AME licence has changed the engine oil and cleaned the oil filter on a privately registered aeroplane. What must be certified and recorded in the Aircraft Journey Log Book and by whom?

243. Why are oleos used on aeroplanes?

244. What action should be taken when an electric circuit is reactivated by pushing a circuit breaker in and it immediately pops out (disengages) again?

245. What is indicated if during an engine "run-up", black smoke issues from the exhaust pipe?

246. What is indicated if during an engine "run-up", blue smoke issues from the exhaust pipe?

247. What is the reason other than safety, that aircraft engines are equipped with dual ignition?

248. What effect would the failure of one magneto have on the performance of an aircraft engine in flight?

249. What special precaution should be taken, when an aircraft that has a magneto ground wire disconnected, is to be parked unattended?

250. What effect will a broken or disconnected magneto ground wire have on an aircraft engine during flight?

251. What is the primary advantage of using a fuel injection system instead of a float type carburettor?

252. In which position should a manually operated mixture control be set for take-off at sea level?

253. Why should a rich mixture setting be used during a prolonged climb?

254. What mixture setting would cause an engine to "back-fire" during cruising flight?

255. What effect would the application of full carburettor heat have on the RPM of an aeroplane with a fixed pitch propeller?

256. Why would the formation of carburettor ice cause a reduction of power?

257. How would the presence of carburettor ice be indicated while flying an aeroplane equipped with a fixed pitch propeller?

258. Under what atmospheric conditions will carburettor ice formation be greatest?

259. Is it possible for carburettor icing to occur when the outside air temperature is $20^{o}C$?

260. Is it possible for carburettor icing to occur in clear air which is of high relative humidity and above freezing temperatures?

261. When carburettor ice has formed in a carburettor mixing chamber, will the application of heat always result in an immediate increase in RPM in an aircraft equipped with a fixed pitch propeller?

262. What effect will the application of carburettor heat have on manifold pressure and RPM of an aircraft equipped with a fixed pitch propeller?

263. What causes a constant speed propeller to remain at a steady RPM regardless of aircraft attitude?

264. How is the viscosity of an oil identified?

265. Why should the use of carburetter heat be kept to a minimum whilst taxiing?

INTENTIONALLY LEFT BLANK

INSTRUMENTS

266. What is the lubber line of a compass?

267. What effect has northerly turning error on a magnetic compass during turns?

268. What effect does the vertical component of the earth's magnetic field have on a compass?

269. How should an aeroplane be flown in order to minimize the effects of acceleration and northerly turning errors in the magnetic compass?

270. When flying in the northern hemisphere, will acceleration on a westerly heading cause the compass to indicate a turn?

271. When flying in the northern hemisphere, will deceleration on an easterly heading cause a compass needle to indicate a turn?

272. What is the maximum time interval permitted between calibrations (swinging) of a magnetic compass in a privately registered aircraft?

273. What is the object of "swinging" (calibrating) on aeroplane compass?

274. What is the reason for mounting the magnet system of a compass in a pendulous manner?

275. What does the white colour band indicate on a colour coded airspeed indicator?

276. What does the lower end of the green colour band indicate on a colour coded airspeed indicator?

277. What does the red line indicate on an airspeed indicator?

278. What does the yellow colour band indicate on a colour coded airspeed indicator?

279. What source(s) of pressure activate an airspeed indicator?

280. What is the operating principal of an airspeed indicator?

281. What would be the effect on an airspeed indicator if, during a climb, the dynamic pressure line became completely blocked?

282. What causes the true airspeed of an aeroplane to differ from its indicated airspeed?

283. Does the difference between indicated airspeed and true airspeed remain constant as altitude is increased?

284. What forces act on the ball in a turn and bank indicator?

285. What information regarding flight attitude is indicated when the needle and ball of a turn and bank indicator are centred?

286. What information regarding flight attitude is indicated when the needle and ball of a turn and bank indicator are to the right of centre?

287. What information regarding flight attitude is indicated when the needle of a turn and bank indicator is left of centre and the ball is right of centre?

288. What information regarding flight attitude is indicated when the needle of a turn and bank indicator is right of centre and the ball is centred?

289. What is the main advantage of a directional gyro (direction indicator)?

290. Why is it necessary to reset a directional gyro periodically?

291. What pressure source activates a vertical speed indicator?

292. Which of the following instruments, airspeed indicator, vertical speed indicator and altimeter, should be connected to a static pressure source?

293. Which of the following instruments, airspeed indicator, vertical speed indicator and altimeter, should be connected to a dynamic pressure source?

294. What is the pressure source to which an altimeter is connected?

295. When parking an aircraft at night the altimeter is correctly set and indicates the height of the airport (500 feet ASL). The next morning the altimeter indicates 600 feet. If the altimeter setting has not been changed what is the most likely reason for the indicated change of altitude?

296. What is the basic principle on which an altimeter functions?

297. What effect would an approaching low pressure system have on the altitude indicated by an altimeter in a parked aircraft?

298. What will be the effect on the altitude indicated by an altimeter, if the barometric scale is reset to a lower value?

299. When an altimeter is set to the current altimeter setting for an airport, what height will it indicate when the aircraft lands at that airport?

300. Does compass deviation vary with heading?

INTENTIONALLY LEFT BLANK

THEORY OF FLIGHT

301. How are the principles expressed in Bernoulli's theorem related to the production of lift?

302. What are the four basic forces which act on an aeroplane in flight?

303. The sum of an aircraft's weight forces can be assumed to act through a certain point or centre. What is this centre called?

304. The sum of an aircraft's lift forces can be assumed to act through a certain point or centre. What is this centre called?

305. What is the relationship between lift and speed?

306. How does pressure distribution on an aerofoil produce lift?

307. Is a lift vector represented by a line drawn at right angles to the airflow or the wing chord?

308. What is the relationship between thrust and drag when an aeroplane is in straight and level flight at a constant speed?

309. What is the term used to describe the curved surface of an aeroplane wing?

310. What is the term used to describe a straight line distance between the leading and trailing edges of a wing?

311. What is the term used to describe the main structural member running lengthwise through an aeroplane wing?

312. What is the relationship between induced drag and aspect ratio?

313. Define aspect ratio.

314. What is the function of an aeroplane's horizontal stabilizer?

315. What is the purpose of off-setting the fin of an aeroplane?

316. What is the relationship between induced drag and airspeed?

317. What is induced drag?

318. What is the angle of incidence?

319. What is the angle of attack?

320. What section of the airflow flowing past a wing is defined as the boundary layer?

321. What is meant by streamlining an aeroplane?

322. How would you describe the longitudinal axis of an aeroplane?

323. Will a wing always stall at the same angle of attack?

324. What happens to the lift and drag of an aerofoil when the angle of attack is increased beyond the stalling angle?

325. What happens to the centre of pressure immediately after the angle of attack of an aerofoil exceeds the stalling angle?

326. What happens to the centre of pressure of an aerofoil when the angle of attack is increased towards the stalling angle?

327. Does the indicated airspeed at which an aeroplane stalls, increase or remain constant as the angle of bank is increased?

328. Will the stalling speed of an aeroplane increase in a co-ordinated banked turn?

329. Will the indicated stalling speed of an aeroplane increase with an increase in altitude?

330. An aeroplane stalls at 2000 feet ASL at an indicated speed of 40 KT. At what indicated speed will it stall at 6000 feet ASL?

331. What term is used, to express the ratio of the load acting on an aeroplane's wings in a particular condition of flight, to the gross weight of that aeroplane?

332. What is the effect of propeller torque on an aeroplane in flight?

333. In what respect is the best gliding speed of an aeroplane related to lift/drag ratio?

334. What influence will wind have on an aeroplane's rate of climb?

335. Would you use the normal approach speed when approaching to land in gusty wind conditions?

336. What document would provide information on the correct trim control position for take-off?

337. When the elevator trim control of an aeroplane is set full "tail heavy", should the elevator trim tab be fully up or fully down?

338. For which flight configuration are fixed trim tabs set?

339. What is inherent stability?

340. What is dihedral angle?

341. What effect will the propeller slipstream have on an aeroplane during the take-off run?

342. What movement of an aircraft takes place about the normal axis?

INTENTIONALLY LEFT BLANK

METEOROLOGY

GENERAL

351. Convert -40^{o} Fahrenheit to Celsius. (Computer may be used)

352. What is the rate that the temperature of the Standard Atmosphere decreases with each 1000 feet of height?

353. Define atmospheric pressure.

354. What unit of measurement is generally used in aviation meteorology to express sea level pressure?

355. What does the term "dewpoint" mean?

356. What governs the amount of water vapour that a given volume of air can contain at a given pressure?

357. What is an inversion?

358. What is the relationship between the lapse rate and the stability of an air mass?

359. What term is used to describe an air mass which continues to rise after an initial push?

360. What is the probable upper limit of low level turbulence when there is an inversion at 5000 feet?

361. What type of cloud is associated with stable air?

362. What degree of turbulence and type of cloud can be expected when flying in a stable air mass?

363. What degree of turbulence may be expected in the lower levels when cold air is moving over a warm surface?

364. What visibility is normally associated with a cold air mass moving over a warm surface?

365. At what period of the day would turbulence due to surface heating be most severe?

366. What form of cloud and precipitation is normally associated with moist and unstable air?

367. What is the relationship between lapse rate and the occurrence of thunderstorms at a warm front?

368. What effect may rough broken ground have on the degree of turbulence in the lower level?

369. In what unit of pressure is the altimeter setting normally given?

370. What atmospheric conditions are assumed in the calibration of altimeters?

371. Will the actual altitude ASL be higher or lower than the indicated altitude when an aircraft is flown into a low pressure area while maintaining a constant indicated altitude?

372. What is the relationship between pressure gradient and wind speed?

373. Would you expect high or low wind speeds in an area where the isobars are closely spaced on a weather map?

374. What wind and cloud conditions are normally associated with an extensive high pressure area?

375. What is the relationship between wind and horizontal pressure differences?

376. If a person stands with his back to the wind in the Northern Hemisphere, would the centre of lowest pressure be on his left or his right?

377. With respect to "veering" and "backing", what change in wind direction and speed may be expected in a descent from 3,000 feet AGL to the surface?

378. Why should caution be exercised when flying near the leeward side of mountains?

379. Left drift is experienced by a westbound flight. Will the altimeter indicate too high or too low at destination if it has not been reset during the flight?

380. What is the lowest layer of the atmosphere called?

381. What occurs to the lapse rate at the tropopause?

382. What proportion of the total weight of the earth's atmosphere lies below 18,000 feet?

383. What is the most important element in the atmosphere from the standpoint of weather?

384. What are the upper and lower limits of the base of altostratus cloud?

385. What types of clouds are classified as clouds of vertical development?

386. What general cloud classification suggests vertical currents and bumpy flying conditions in the lower levels?

387. What type of cloud is usually associated with poor visibility and low ceilings?

388. What precipitation should a flight encounter when overcast cirrus cloud is reported along the route?

389. What type of cloud is usually associated with continuous rain and poor visibility?

390. What type of cloud is normally associated with drizzle?

391. What type of cloud is indicated by the presence of hail?

392. What degree of turbulence should be encountered during flight under an overcast of stratus cloud?

393. Is an air mass an extensive body of air with practically uniform properties of temperature and moisture in the horizontal?

394. Would light or strong winds normally be encountered on a flight within an extensive anti-cyclone (high pressure area)?

395. After passing through a frontal zone, is an alteration in heading to the left or an alteration to the right required to maintain track?

396. What type of front is involved when a cold air mass is overtaking a warm air mass?

397. How is the warm air lifted at a cold front?

398. Is a definite wind shift associated with the passage of an active cold front?

399. What type of cloud and precipitation usually accompany the passage of a cold front if the warm air is moist and unstable?

400. What type of frontal movement is associated with strong, gusty surface winds?

401. What degree of turbulence is associated with line squalls?

402. What type of front is associated with line squalls?

403. What causes the cooling of the warm air at a warm front?

404. What types of cloud normally indicate the approach of a warm front?

405. What is the most common reason for avoiding VFR flight through a warm front?

406. What type of precipitation is most likely aloft during winter when an aircraft, flying in the cold air mass towards a warm front, encounters light ice pellets mixed with snow?

407. What type of front is an aircraft approaching when patches of rough ice begin to form on the leading edges during flight in the cold air mass below a gradually lowering overcast?

408. What is a trowal?

409. What is the classification of a sky condition when the sky is 7/10 covered by cloud?

410. What conditions of temperature and dewpoint are conducive to the formation of radiation fog?

411. What type of fog may be associated with the centre of a high pressure area (anti-cyclone)?

412. How may the temperature and dewpoint in aviation weather reports be used to assess the likelihood of fog forming at a particular airport?

413. What causes extensive fog over the surface of the ocean while the land remains clear?

414. What type and degree of ice accretion will result from flight through freezing rain?

415. What type of cloud is associated with thunderstorms?

416. What are the atmospheric conditions required for the development of a thunderstorm?

417. Hail, lightning, turbulence and icing are hazards that may be encountered when flying through a thunderstorm. Which of these is generally considered to be the least dangerous to an aeroplane in flight?

418. Why is it not advisable to land an aircraft while a thunderstorm is passing over the landing area even though the ceiling and visibility are favourable?

419. What is the name given to the lowest layer of the atmosphere?

INTENTIONALLY LEFT BLANK

METEOROLOGY

WEATHER MAPS

420. What is the name given to the lines on a weather map which join points of equal mean sea level pressure?

421. What symbol is used to identify a centre of high pressure on a weather map?

422. What symbol is used on a weather map to identify a centre of low pressure?

423. What symbol is used on a weather map to identify a warm front?

424. What colour may be used to identify a warm front on a weather map?

425. How may the approximate direction of the wind be determined from isobars on a weather map?

426. What symbol is used on a weather map to identify a cold front?

427. How is a Maritime Arctic air mass identified on a weather map?

FACN1 CYEG 171720
18-06

ALL HTS ASL UNLESS NOTED

PROG
FLAT RDG FORT SMITH-MCMURRAY-LETHBRIDGE AT 1800Z MOVG TO
MEDICINE HAT-NORTH BATTLEFORD-250 MI E OF FORT SMITH BY 0600Z.
SLOLY DPNG TROF PRINCE GEORGE-FORT NELSON. AIR UNSTBL AND
FAIRLY MOIST. UPSLP CNDS OVR SRN ALTA

YEG-1
LETHBRIDGE RGN
CLDS AND WX. 50 OVC 80 110BKN 140 BCMG 50BKN 80 110 BKN 140 AFT 0400Z
ICG. LGT RIME ICGIC. FRLVL 40

YEG-2-3-4
CALGARY CORONATION EDSON RGNS

CLDS AND WX. 60BKN CU100/-SCT BCMG /-SCT AFT 0100Z

ICG. LGT RIME ICG IN CU. FRLVL 40

YEG-5
EDMONTON RGN
CLDS AND WX. 60BKN CU100 OCNLY 60BKN TCU 150 6RW - BCMG 100 BKN 130
BY 0200Z

ICG. MDT CLR ICG IN TCU 60-150 OTRW LGT ICGIC. FRLVL 40

TURBC MDT NR TCU TIL 2400Z

END

The next 15 questions refer to the area forecasts reproduced on page 42.

428. What was the date and time of issue of the Area Forecast (FACN1)?

429. What is the validity period of the Area Forecast?

430. How often are routine Area Forecasts issued and what is their period of validity?

431. What type of pressure system is overlying Fort Smith - McMurray - Lethbridge at 1800Z, according to the prognosis?

432. What is the direction of movement of the pressure system overlying Fort Smith - McMurray - Lethbridge at 1800Z, referred to in the prognosis?

433. What is the approximate speed of movement of the pressure system overlying Fort Smith at 1800Z referred to in the prognosis?

434. What type of pressure system is referred to in the prognosis for the Prince George - Fort Nelson area?

435. What is the condition of the air mass overlying the area referred to in the prognosis?

436. How are heights normally expressed in an Area Forecast?

437. What is the height of the lowest cloud expected during the forecast period for the Lethbridge region?

438. What cloud cover is expected for the Lethbridge region during the forecast period?

439. What icing conditions are forecast for the Calgary, Coronation and Edson regions?

440. What is the freezing level expected to be in regions 2-3-4 of the Area Forecast?

441. What cloud and weather is expected for the Edmonton Region during the forecast period?

442. What turbulence is forecast for the Edmonton region?

The next nine questions refer to the following terminal forecasts.

Terminal Forcasts

FTCN2 CWTO 091645

YQG 091717 50SCT C100BKN 6H 2315. 0900Z C50BKN 100 OVC RW- 2320.
YYZ 091717 C30BKN 80BKN 6H 2312. 0600Z 50SCT C120BKN. 1200Z 120SCT
YTR 091717 30SCT C100BKN / OVC 6H 2315G20 OCNL RW-. 1000Z 50SCTC120BKN 2315

443. What is the forecast ceiling for YTR at the beginning of the forecast period?

444. What is the sky condition expected to be at YYZ after 1200Z?

445. What is the forecast surface wind for YTR at 1000Z?

446. What is the forecast weather for YTR at the beginning of the forecast period?

447. What is the validity period of an FTCN2?

448. What is the forecast ceiling for YQG at 0900Z?

449. What change is expected to the ceiling at YQG during the forecast period?

450. For what period of time is the surface wind at YTR forecast to be 15 KT gusting to 20 KT?

451. What is the visibility and weather at YTR expected to be at the beginning of the forecast period?

The next 14 questions refer to the following weather reports.

SACN1 CYWG 041500

YWG B12 OVC 2S-F 207/9/4/3419G28/007/SC10 QADOS 214
YQK P5X1/2S 168/6/0/3416/991/S10 VSBY OCNL 1/4 114
YXL 6SCT A18BKN 220 OVC 3SW- 151/0/-4/3214/985/SF1SC6C13 315
YGM M11BKN 40 OVC 1 S-F 206/10/6/3418G32/007/SF5NS4 DRFTG SNW 115
YPG E30BKN 100 OVC 3S- 210/5/3/3432/008/SC7AC3 DRFTG SNW 118
YBR -XM30 OVC 1/2S-BS 211/3/-2/3329G44/BS7SC3 117

452. What is the meaning of "SACN1 CYWG 041500"?

453. Does a weather report have a validity period?

454. How is the method for determining the ceiling height at YWG indicated?

455. What sky condition and height of cloud is indicated in the YBR report?

456. What is the visibility at YQK?

457. What is the meaning of "S-F" in the YGM report?

458. What is the barometric pressure at YWG?

459. What is the temperature at YGM?

460. What is the dewpoint at YWG?

461. What was the spread between the temperature and dewpoint at YQK?

462. What is the surface wind velocity at YQK?

463. What cloud layers constituted the overcast condition at YXL?

464. What was the ceiling at YPG at the time of the report?

465. What is the meaning of the figures "118" at the end of the YPG report?

The next 2 questions refer to the following upper wind and temperature forecasts.

Upper Wind and Temperature Forecasts

FDCN1 CWAO 071530
BASED ON 1200 DATA VALID 080000 FOR USE 21-03

	3000	6000	9000	12000	18000
YVR	2621	2425-07	2430-10	2434-16	2542-26
YYF	2523	2432-04	2338-08	2342-13	2448-24
YXC		2431-02	2339-06	2344-11	2352-22
YYC		2426-03	2435-06	2439-12	2347-22
YQL		2527-01	2437-05	2442-10	2450-21

466. The Upper Wind and Temperature Forecast is valid for use between what hours?

467. What is the forecast wind and temperature at 6000 feet for Calgary (YYC)?

The next 2 questions refer to the following SIGMET report.

SIGMET

WSCN CYYZ 171800
171800-172200Z
SIGMET 5. LN of TSTMS OBSD ON WX RADAR YYB YQA YXU TOPS TO 30 THSD
MOVG E 20
END

468. At what time was the report issued?

469. What weather is indicated in the SIGMET 5 report?

NAVIGATION
(CROSS COUNTRY FLIGHT)

Typical Cross-Country Flight

A light single-engined aeroplane, registration C-FPPA, equipped with VOR and VHF transceiver is at Oshawa Airport. It is proposed to fly to Barrie Airport to pick up a passenger, then fly to Ottawa International Airport via the town of Atherley.

Route Detail

Leg I

Oshawa Airport (43°56'N, 78°54'W) to Barrie Airport (44°24'N, 79°44'W)

Legs II and III

Barrie Airport to Ottawa International Airport (45°19'N, 75°40'W)
via the town of Atherley (44°36'N, 79°22'W)

NOTE: Measure all distances in nautical miles. When airports are involved, the centre of the airport symbol should be used as a measuring point.

Pre-flight activities include:

(a) a weather briefing for the proposed flight

(b) a review of all available information appropriate to the intended flight

(c) preparation and review of the Toronto - Ottawa aeronautical chart supplied

(d) filing a single VFR flight plan for the complete flight

(e) aeroplane document check

(f) aeroplane pre-flight check.

501. Of the airports proposed to be used on this flight, how many have more than one hard surfaced runway?

502. What is the radius of the Oshawa Control Zone?

503. How are Hypsometric (layer) tints used in determining the height of the ground to be flown over along the proposed route?

504. What does the topographical symbol "1340", which is located 10 nautical miles northwest of Oshawa along the intended track represent?

505. What provision is made on the chart to quickly locate the highest spot elevation on the chart?

506. What is the elevation of the highest obstruction within 3 nautical miles either side of the proposed route Barrie to Ottawa?

NOTE:

(a) For the next series of questions it is suggested a Flight Log be prepared.

(b) In view of the weather briefing and other factors, the flight is planned at a cruising altitude of 2,000 feet Oshawa - Barrie and 3,000 feet Barrie - Atherley - Ottawa using a true airspeed of 110 KT and W/V 230^{o} true at 15 KT.

(c) In this exercise place names refer to airports unless otherwise stated.

507. What is the distance from Oshawa to Barrie?

508. What is the true track from Oshawa to Barrie?

509. What is the true heading from Oshawa to Barrie?

510. What is the magnetic heading Oshawa to Barrie?

511. What is the estimated ground speed Oshawa to Barrie?

512. What is the distance from Barrie to the town of Atherley?

513. What is the true track from Barrie to the town of Atherley?

514. What is the true heading from Barrie to the town of Atherley?

515. What is the magnetic heading from Barrie to the town of Atherley?

516. What is the estimated ground speed from Barrie to the town of Atherley?

517. What is the distance from the town of Atherley to Ottawa?

518. What is the true track from the town of Atherley to Ottawa?

519. What is the true heading from the town of Atherley to Ottawa?

520. What is the magnetic heading from the town of Atherley to Ottawa?

521. What is the estimated ground speed from the town of Atherley to Ottawa?

522. What is the estimated flying time Oshawa to Ottawa?

523. What time should be entered under "Est. Elapsed Time" on the flight plan if a single flight plan for the total flight is filed, allowing for a 30 minute stop at Barrie?

524. How much fuel would be consumed if the estimated ground speed for the flight is 115 KT and the average rate of fuel consumption is 5.2 gallons per hour?

525. What amount of usable fuel must be on board the aeroplane at Oshawa to provide for the complete flight and necessary reserve, with an average rate of consumption of 5.2 gallons per hour?

526. Calculate the maximum amount of baggage that may accompany the passenger when loading at Barrie based on the following weights:

aeroplane gross weight	1600 LB.
aeroplane empty weight	1090 LB.
oil	11 LB.
pilot and passenger	330 LB.
estimated fuel remaining at Barrie	125 LB.

527. What time (GMT) should be entered on the flight plan if the estimated time of departure from Oshawa is 1 p.m. eastern daylight time?

528. What are the advantages of the use of 10^{o} lines drawn on both sides of track when preparing the chart for the flight?

529. The following taxi clearance is received from Oshawa Ground Control:

"PPA Oshawa Ground, runway 22, wind 210 at 10, time 1901,altimeter 2992, cleared to taxi via taxiway".

What position may the aeroplane taxi to without further clearance?

530. What radio frequency should be used to request take-off clearance at Oshawa?

The actual time of departure from Oshawa is 1910Z.

---

531. When would this flight expect to be released from tower frequency?

532. The Kleinburg VORTAC ($43^{o}52'N$, $79^{o}35'W$) could be utilized as an aid in locating Barrie. Which radial of this VORTAC intersects the airport?

533. How is the Kleinburg VORTAC positively identified on the VOR receiver?

534. What information can be obtained from the aerodrome symbol at Barrie?

535. What information can be obtained from the aerodrome data at Barrie?

536. Where should the let-down to circuit height be performed, relative to the runway in use at Barrie? Note Barrie is an uncontrolled airport.

537. What height should the aeroplane altimeter indicate when flying crosswind before joining the circuit at Barrie?

538. Where should the circuit be joined after flying crosswind at Barrie?

The landing is completed at Barrie and the passenger and baggage are loaded on board.

At 2034Z, following take-off from Barrie, the aeroplane is levelled off at 3000 feet over the airport on a heading for the town of Atherley.

---

539. What is the estimated time over the town of Atherley and ETA Ottawa?

540. Approaching the town of Atherley the heading of the aeroplane is indicated on the magnetic compass as 053°. What is the approximate true heading using the compass correction card below?

COMPASS CORRECTION CARD

FOR (Magnetic)	000	030	060	090	120	150	180	210	240	270	300	330
STEER (Compass)	002	032	061	090	118	147	178	208	240	271	303	334

541. What is the TAS of the aeroplane at the cruising altitude of 3000 feet given the following information?

IAS (no instrument or position error)	105 KT.
Outside Air Temperature	26°C (79°F)

Time over the town of Atherley is 2047Z.

---

542. What was the average ground speed between Barrie and the town of Atherley?

543. What radio frequency should be monitored to keep informed of movements of other aircraft when flying in uncontrolled airspace?

544. Thirty miles after passing Atherley it is observed that the aeroplane is 2 miles left of track. Heading is altered 8° right. What approximate distance would be flown before regaining track?

545. What was the average ground speed since passing the town of Atherley, when at 2113Z the aeroplane position is 44°49'N, 78°20'W?

546. The 2113Z position could be confirmed by tuning in the Stirling VORTAC and setting the omni bearing selector to 325. When the track bar (left right needle) centres, what will the "TO" "FROM" display indicate?

Following the confirmation of position at 2113Z, it is noticed that the fuel quantity gauges indicate a low fuel supply and it is decided to divert and land at Bancroft Airport (45°04'N, 77°53'W).

---

547. What radio frequencies could be used to close the flight plan with Stirling Radio?

548. How soon shall ATC be notified of deviation from the flight plan?

After landing at Bancroft, the cause of loss of fuel was found to be a loose filler cap. Preparation is made to continue the flight to Ottawa.

---

549. When refuelling from drums why is it good practice to filter the fuel through a chamois?

550. What is the take-off distance required to clear a 50 foot obstruction given the following data and using the take-off distance graph below?

(a)	flaps	retracted
(b)	runway	consider hard surfaced for this exercise
(c)	headwind	0
(d)	airport elevation	1250 feet
(e)	temperature	90°F (standard temperature at airport altitude is 55°F)
(f)	gross weight	1600 LB.

—TAKE-OFF DISTANCE—— FLAPS RETRACTED HARD SURFACE RUNWAY

GROSS WT. LBS.	IAS 50 FT. MPH	HEAD WIND KNOTS	AT SEA LEVEL & 59° F.		AT 2500 FT. & 50° F.		AT 5000 FT. & 41° F.		AT 7500 FT. & 32° F.	
			GROUND RUN	TOTAL TO CLEAR 50 FT. OBS	GROUND RUN	TOTAL TO CLEAR 50 FT. OBS	GROUND RUN	TOTAL TO CLEAR 50 FT. OBS	GROUND RUN	TOTAL TO CLEAR 50 FT. OBS
1600	64	0	735	1385	910	1660	1115	1985	1360	2440
		10	500	1035	630	1250	780	1510	970	1875
		20	305	730	395	890	505	1090	640	1375

NOTES: 1. Increase the distances 10% for each 35°F. increase in temperature above standard for the particular altitude.
2. For operation on a dry, grass runway, increase distances (both "ground run" and "total to clear 50 ft. obstacle") by 7% of the "total to clear 50 ft. obstacle" figure.

551. What is the length of runway remaining at the point of take-off, given the following data and using the take-off distance graph on page 52?

(a)	runway length	1800 feet
(b)	flaps	retracted
(c)	runway	consider hard surfaced for this exercise
(d)	headwind	0
(e)	airport elevation	1250 feet
(f)	temperature	90^{o}F
(g)	gross weight	1600 LB.

552. What is the fuel capacity in imperial gallons of fuel tanks holding 25 U.S. gallons?

553. What is the weight of 15 imperial gallons of aviation gasoline?

554. After take-off from Bancroft, the aircraft is climbed at 300 feet per minute. How long will it take to reach cruising altitude of 3000 feet?

Departure from Bancroft for Ottawa is 2215Z. A flight plan is air-filed through Stirling Radio. The next series of questions concern enroute and arrival procedures.

---

555. When would Ottawa Radio broadcast SIGMET (significant in-flight weather)?

556. What radio frequency may be used to receive the scheduled weather broadcast from Ottawa Radio?

557. What is the radio frequency and the morse code identification of the Ottawa VORTAC?

558. When should initial radio contact be made with Ottawa tower?

559. What track would be made good if the aeroplane was tracking inbound on the 270^{o} radial of the Ottawa VORTAC?

560. What would be the approximate magnetic heading of the aeroplane on a right base leg for runway 22 at Ottawa?

561. What restriction with respect to operating distance from cloud is in effect at Ottawa with the weather reported as ceiling 700 feet over-cast, visibility 1 mile and Special VFR flight is authorized?

562. Once established on the downwind leg for runway 22 at Ottawa, tower is advised accordingly. If there is other traffic in the circuit, what information will tower supply?

563. Who is responsible for filing an arrival report after landing at Ottawa?

NAVIGATION

GENERAL

564. What is the purpose of contour lines on the chart?

565. Why are Hypsometric (layer) tints used on topographical charts?

566. What is the height of the ground at the base of the tower located 15 nautical miles from the Ottawa VOR on the 208° radial?

567. What is the purpose of topographical symbols on the charts?

568. How many Canadian airports or aerodromes indicated on the chart have a control tower?

569. What is an isogonic line?

570. At what point along the track line should a track angle be measured on a transverse Mercator chart?

571. Does the plane of a Great Circle always pass through the centre of the earth?

572. Do lines of longitude on the chart converge towards the north pole?

573. Are the lines on the chart representing 45° north latitude and 46° north latitude parallel?

574. What is the distance in nautical miles between $44^{\circ}19'N$, $80^{\circ}00'W$ and $45^{\circ}20'N$, $80^{\circ}00'W$?

575. Which chart joins the Toronto - Ottawa chart to the north?

576. Approximately how many nautical miles per inch does the scale of 1:500,000 represent?

577. What is the ratio between the unit distance on the chart and the actual distance on the earth called?

578. How are heights of obstructions shown on the chart?

579. Does the sun set earlier in relation to GMT at an eastern airport than at a western airport when both are located on the same parallel of latitude?

580. What is the line of zero longitude called?

581. How many degrees of longitude comprise a standard time zone?

582. What is the standard time at 75^{o} west longitude when it is noon at Greenwich?

583. Is the location of the north magnetic pole a fixed geographic position?

584. From which datum point is variation measured?

585. What is the name given to the angular difference between magnetic north and true north?

586. How is westerly deviation applied to a magnetic heading to obtain the compass heading?

587. What factors of a vector triangle must be known to determine wind velocity?

588. What would be the approximate increase in TAS over an IAS of 100 KT for each per 1000 feet increase of height?

589. Which vector of a triangle of velocities is used to measure airspeed?

590. What is meant by orientation of a chart?

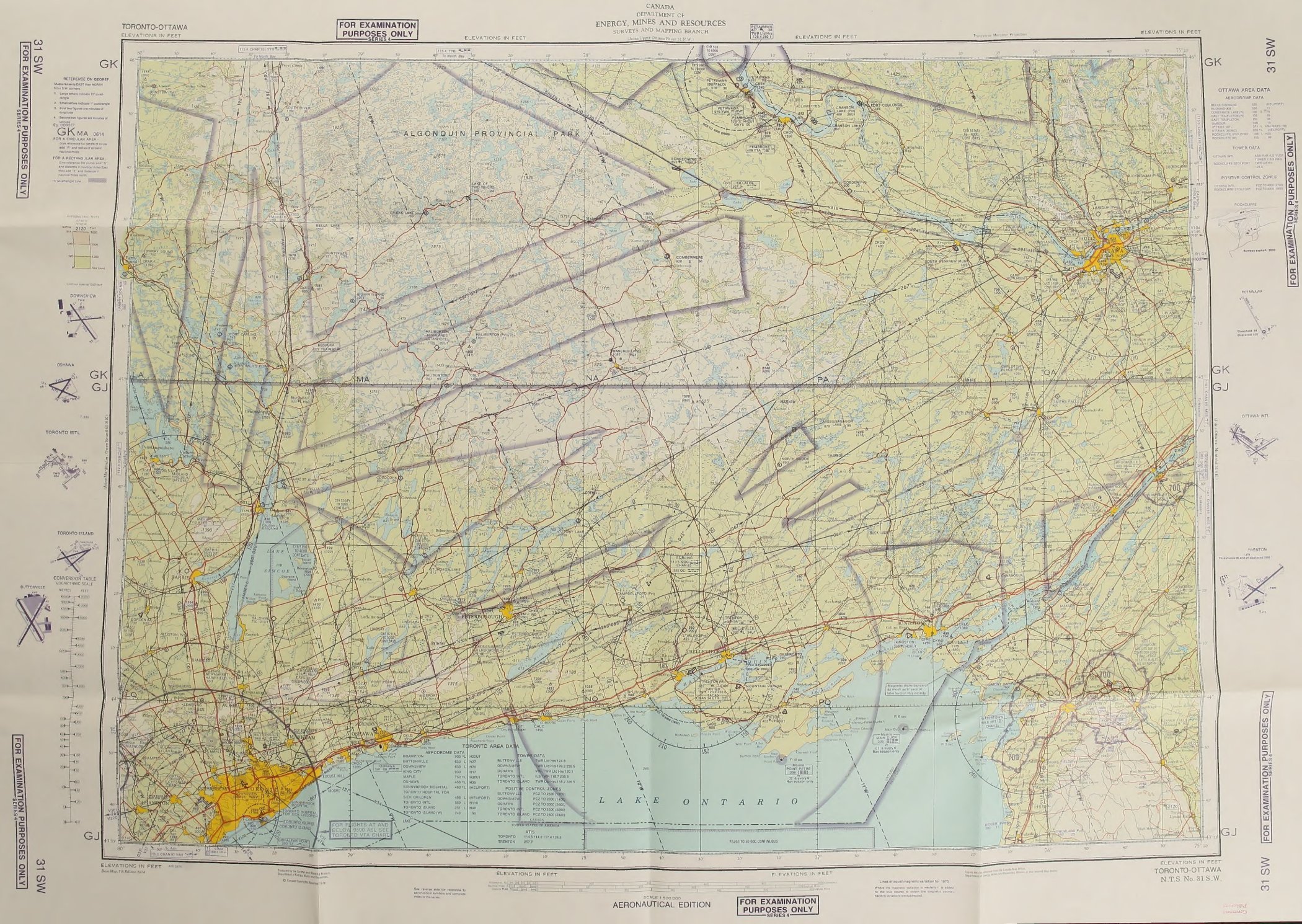
591. What is the ground speed of an aeroplane flying 1 mile in 24 seconds?

592. How many variables are there in a triange of velocities?

593. What is 46 KT equal to in MPH?

594. How many statute miles are there in 39 NM?

595. How many map features should be used to identify an aircraft position?


TORONTO-OTTAWA
ELEVATIONS IN FEET
FOR EXAMINATION PURPOSES ONLY
SERIES 4
CANADA
DEPARTMENT OF
ENERGY, MINES AND RESOURCES
SURVEYS AND MAPPING BRANCH
Transverse Mercator Projection
31 SW
GK
GJ
ALGONQUIN PROVINCIAL PARK
LAKE ONTARIO
TORONTO AREA DATA
AERODROME DATA
TOWER DATA
POSITIVE CONTROL ZONES
OTTAWA AREA DATA
TORONTO ISLAND
OSHAWA
TORONTO INTL
OTTAWA INTL
PETAWAWA
TRENTON
BUTTONVILLE
CONVERSION TABLE
LOGARITHMIC SCALE
FOR FLIGHTS AT AND BELOW 8500 ASL SEE TORONTO VTA CHART
AERONAUTICAL EDITION
SCALE 1:500 000
N.T.S. No. 31 S.W.